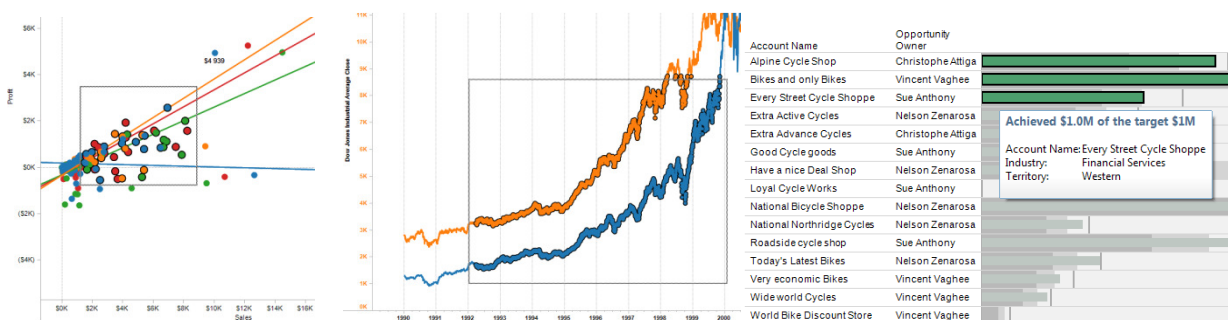


Multi-touch Selection for Collaborative Data Visualization

Multi-touch devices offer the possibility to use several fingers, multiple hands, and interactions from multiple people for the manipulation of items on a screen. Yet, windowing environments have taught users to experience computers with one hand, focusing on a single point. What happens when those constraints are relaxed, as in multi-touch environments?

This project will focus on the problem of selecting data items in visual data representations using multi-touch. Traditionally, selection is performed using a mouse-click or lasso selection and then a highlight to indicate which items have been selected (see figure below) but this is no longer feasible for multi-touch environments.



In multi-touch environments selection of items of interest is not as simply performed because

- Several data items could lie under one finger leading to occlusion
- Highlights should be encoded to be visible and distinguishable between several people working together
- Multiple-fingers can be used for selection but sometimes it is necessary to de-select parts of an existing selection. How can fingers be used to de-select part of an existing selection?

In addition data representations have several other characteristics which influence selection:

- Data can be very dense in some regions and very sparse in others, hence a selection mechanism is needed which can fluidly adapt to the density of the information underneath a finger or hand
- Selection can take the shape of the data into account. How can we define gestures which select data following hand shape?

The goal of this project is to tackle some of the main challenges presented above in the context of a data analysis scenario.

The student will have to implement simple visualizations and use a multi-touch tabletop or desktop display to implement selection mechanisms for multi-touch in C# or Java.

Requirements:

- The student should have skills programming C# or Java
- The student should be comfortable communicating in English